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ABSTRACT

Designed to be used by practicing teachers, students who are learning to become teachers, and faculty members who instruct such students, this manual describes how to use attending cues and responses to help children with mild disabilities attend to the important aspects of instructional activities, and how to use attending cues and responses to help children learn additional appropriate behaviors. The manual includes: (a) background information describing the importance of attention and of direct instruction, and the context for using attending cues and responses; (b) definitions and descriptions of various attending cues and attending responses, information on how to select attending cues and responses, and a taxonomy of those cues/responses; (c) information on how to use attending cues and attending responses to increase the efficiency of instruction, including to increase the rapidity of learning and to teach target and non-target behaviors; (d) a summary of some of the related research; and (e) three self-tests for checking the reader's understanding of the content of the manual. An appendix includes a list of related studies. (Contains 25 references.) (CR)

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Using Attending Cues and Responses to Increase the Efficiency of Direct Instruction

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1992

Learning Efficiently: Acquisition of Related Non-Target Behaviors

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Purpose of the Manual

This manual describes how to use attending cues and responses to increase the efficiency of direct instruction. The manual is designed for use by practicing teachers, students who are learning to become teachers, and faculty members who instruct such students. Our intent is to disseminate the information from our research to as many individuals as possible; therefore, we give permission for users to reproduce the document and to use it, in whole or in part, in their own training and research activities. We request, however, that any reproductions maintain the authorship of the manual, and that it contain an acknowledgement and disclaimer that manual was developed by the a grant (Project LEARN, Grant Number H023C00125) from the U.S. Department of Education.

Description of the Manual

This manual contains several sections: (a) background information describing the importance of attention and of direct instruction, (b) definition and description of various attending cues and attending responses and a taxonomy of those cues/responses, (c) information on how to use attending cues/responses to increase the efficiency of instruction, (d) a summary of some of the related research, (e) references for the literature that is cited, and (f) self-tests for checking the reader's understanding of the content.

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Using Attending Cues and Responses to Increase the Efficiency of Direct Instruction

Have you ever said or heard a teacher or parent say any of these comments? "He just doesn't pay attention." "He can learn whatever he wants to learn when he pays attention." "If she would just attend to what I am teaching, ..." "She really attends to ..., but doesn't attend to ..." "At first he didn't attend to what we were doing, but then ..." "She seems to attend, but she just isn't getting it." Nearly all parents, teachers, administrators, and researchers recognize that when students attend to the instruction, they are more likely to learn. We also recognize that paying attention may not be enough to ensure learning. Some students appear to be paying attention to the learning activities and materials, but do not seem to be making adequate progress.

A lot of research has been conducted and a lot has been written about students' attention (Rinne, 1984; Wolery, Bailey, & Sugai, 1988). This work has focused on three distinct but related areas. First, a lot of effort has been devoted to increasing students' on-task behavior (attention) to deal with problem behavior or potential problem behavior in classrooms (Rinne, 1984). If you are a highly accomplished and experienced teacher or if you talk with such teachers, you recognize that getting students involved in classroom activities will reduce the chances of students becoming disruptive and engaging in other problem behaviors. You probably also realize that keeping children busy and participating in interesting activities is one of the best ways available to control students' problem behavior (Wolery & Winterling, in press). The old saying, "idleness is the devil's workshop" reflects this belief. It suggests that when children do not have interesting and constructive things to do, then they are likely to find something interesting to do, and what they find will often be disruptive or unproductive.

A second area in which students' attention has been the topic of study deals with the assumption that if students are engaged and participating (attending) in classroom activities, to the teachers, or with instructional materials, then their chances of learning are increased (McWilliam, 1991; McWilliam & Bailey, 1992). Again, if you are a highly accomplished and experienced teacher, you realize that students are more apt to learn the things we want them to learn if they are engaged in the activities designed to teach them those important skills. So, if students are attending to the classroom activities, the teacher, and/or the materials, they are less likely to engage in problem behaviors and are more likely to learn what we want them to learn.

The third area in which students' attention has been studied deals with whether students are attending to the important aspects of the instructional activities (Cooper, Heron, & Heward, 1987; Wolery, Ault, & Doyle, 1992; Wolery, Bailey, & Sugai, 1988). In other words, it is not enough to have children participate in the activity, they must also attend to what is being taught. Again, if you are a highly accomplished and experienced teacher or if you talk with such teachers, you will realize that sometime students participate in activities, but do not seem to learn from them. For example, elementary-aged students may read a passage from a book, but may not learn the important points from that passage; or, preschool children may play in the block area, but may not learn about the relationship of different sized blocks to one another - or they may play in the socio-dramatic play area, but may not learn to interact with their peers.

Thus, attention is important for children with and without disabilities across a wide age range (i.e., young preschool children, elementary-aged children, and secondary students). Highly skilled teachers, focus on their students' attention to decrease the occurrence of problem behaviors, to increase the chances that students will learn, and to ensure that students are attending to the critical or important aspects of the instructional activities and materials. Most accomplished teachers use a number of different strategies, techniques, and procedures for increasing children's attention in each of these areas. And, it seems that those teachers do this almost automatically. However, they probably learned how to promote students' attention by watching and talking with more experienced teachers, from reading books and articles about it, and through experience - trying things out and keeping what works and discarding what does not work.

Purpose of This Manual

To describe all of the procedures skilled teachers use to help students attend would require many books. So, a short manual, such as this one, cannot deal with everything that is important about students' attention. As a result, this manual has two specific purposes:

1. We describe how to use attending cues and responses to help children attend to the important aspects of instructional activities, and

2. We describe how to use attending cues and responses to help children learn extra behaviors that you are not teaching them directly.

Organization of This Manual

Before we describe what attending cues and responses are and before we describe how to use them, we will present the situations and context in which they should be used. These procedures are very useful in some situations, but they have specific applications and do not address many of the aspects related to attention mentioned above. For example, they are not designed to control problem behavior by increasing students' attention and they are not designed to promote children's general participation in activities. Rather, they are designed to help children attend to the critical aspects of the skills being taught and to help children learn extra information about those skills.

After the situations in which the procedures should be used are described, we will define attending cues and responses and explain a classification system for deciding which attending cues and attending responses to use. The third part of the manual describes steps for using attending cues and attending responses to increase the efficiency of direction instructional activities. The final section of the manual is a summary of the research related to using attending cues and responses. We have included self-tests throughout the manual so that you can check your understanding of the content as you read it.

Context for Using Attending Cues and Responses

Before we describe what attending cues and attending responses are and how to use them, it is important for us to describe the situations and contexts in which they should be used. As you know, teaching involves making many complex decisions. Some of the questions that you have probably asked many times and are often faced by teachers are:

- What skills are really important for my students to learn?
- How should I arrange my classroom so that they are likely to learn those skills?
- How should I schedule my time and their time so that they will learn those skills?
- What materials would be best used to teach them those skills?

- Which instructional strategies should I use to teach them those skills?

- What will motivate my students to learn the important skills?

- How can I evaluate whether they have learned the skills and can go on to other important skills?

These questions and their answers for teachers of children with disabilities have been discussed in several sources (e.g., Bailey & Wolery, 1989, 1992; Barnett & Carey, 1992; Bricker & Cripe, 1992; Carnine, Silbert, & Kameenui, 1990; Cooper et al., 1987; Mercer & Mercer, 1989; Odom & Karnes, 1988; Safford, 1989; Snell, 1987; Wolery, Ault, & Doyle, 1992; Wolery, Bailey, & Sugai, 1988 and many others). Thus, we do not discuss these issues here, but as you realize, they are critical questions and how you answer them and act on them will influence how much children learn and how quickly they will learn it.

Given that you have identified important skills for your students to learn, given that you have arranged your classroom to improve their chances of learning those skills, and given that you have scheduled your time and children's time while they are in the classroom, you are faced with choices about how to actually implement the instruction. For some skills and some children, we use child-directed and self-guided learning. For other skills, we use strategies that can be implemented while children are engaged in child-directed learning activities. For other skills, we used direct instruction.

The procedures described in this manual are designed for use in direct instructional activities. Such activities are used with individual students, small groups of students, or with large groups of students. Attending cues and attending responses can and should be used in direct instructional sessions. It is fair to ask, "What do you mean by 'direct instructional activities/sessions'?" In this section, we answer that question.

What Is "Direct Instruction"?

Direct instruction includes many components. When we use the term, we mean four things. These are described below.

1. Teachers have identified some important behaviors that their students should be taught.

The important behaviors that we identify for students often can be grouped into two broad categories: (a) discrete behaviors, and (b) chained

behaviors. Discrete behaviors are those responses of students that are relatively brief and usually involve only one behavior. Naming a picture, letter, numeral; reading a sight word, answering a question with one or two words, and many other important skills are examples of discrete behaviors. Chained behaviors are those skills for which the student puts a number of different behaviors together in a sequence to form a complex behavior. For example, reading the words of a sentence, putting on a coat, eating a meal, completing a math problem that involves several steps are all chained responses. They involve several behaviors or steps done in sequence to complete some task. The procedures described in this manual are designed for use primarily with discrete behaviors, but they can also be used with short chains of behaviors. For example, they are often used in teaching spelling - which involves saying, writing, or typing a number of letters in a given sequence.

2. The direct instructional sessions are usually relatively short.

The length of any instructional activity may vary greatly. As you know, how long an instructional activity occurs depends upon the time available, the skills being taught, the ages and abilities of the students, and other issues. Direct instructional activities are no exception, however, they are usually relatively short (e.g., 2 minutes to 15 minutes). Usually, with younger children, the sessions are shorter; and often with children who have more severe disabilities, the sessions are shorter. How long the sessions should last is left to the teacher, but usually, they should be short so that students will enjoy them, readily attend to them, and will not become bored with them.

3. Direct instructional activities involve use of a defined trial sequence.

A trial is simply a single opportunity for the student or students to respond. A trial sequence is a list of steps the teacher goes through in presenting the information to students. When watching many teachers provide direct instruction, we often see them do the following steps:

(a) They secure the students' attention,

(b) they present some stimulus or question to the students,

(c) they give the students an opportunity to respond,

(d) they may provide students with help in answering or responding correctly, and

(e) they provide feedback to students on the correctness of their responses (e.g., the praise students when the response is correct and they often tell students how to do the behavior if the response is not correct).

Of course, as you know, there are many variations to the general steps listed above. The procedures for using attending cues and responses described in this manual deal with that first step (i.e., Step "a" - securing students' attention). In direct instructional sessions, this trial sequence may be repeated several times (e.g., 10 to 20 times). Different behaviors may, and probably should, be taught within each session, but the trial sequence may be the same for each of several behaviors being taught.

4. Direct instructional activities involve active responding from students.

Direct instruction, as we use the term in this manual, is not lecturing or simply telling students about some fact or content. Rather, as described in the steps of the trial sequence, it involves giving students opportunities to respond. In some cases, individual children respond on each trial. When individual responding is used, the teacher may randomly pick which student will respond on each trial. When this is done, the students may not know when it will be their turn to answer - so the teacher has to signal them. Another way to present individual trials is to use round-robin responding. With this method, the teacher goes in a predictable order (e.g., from left to right) and each child can learn when it will be their turn. With either method of individual responding, the teacher should try to get all of the children to pay attention during the entire session, even when it is not their turn. Another method teachers use is to have all children respond on all trials. This is known as choral or unison responding. The advantage of individual responding is that each student can be taught different behaviors at the same time. The advantage of choral (unison) responding is that all children are responding more frequently - they do not have to wait for their turn.

Regardless of the method used for having students to respond during direct instructional activities, a couple things are important. First, the trials should be presented at a rapid and brisk pace. While it is possible to present things to rapidly, a rapid pace of presenting trials and having students reponed quickly seems to be associated with more learning, more attention, and less opportunities for children to get bored or distracted. Second, when presenting direct instructional trials, they should be done so that children will be able to respond successfully and correctly. This does not mean that the sessions should involve teaching children what they already know. Rather, it means that children have the entry level skills needed to respond correctly and that

the teacher will provide help (often called prompts) when children do not respond correctly and quickly. Many strategies exist of presenting and removing or fading such help (see Wolery, Ault, & Doyle, 1992 for a discussion of these procedures).

In summary, direct instruction involves teachers attempting to teach specific behaviors to students in relatively short sessions using a trial sequences of several steps that are repeatedly presented and that allow students to respond actively, repeatedly, and successfully. Direct instruction is only one of many different types of teaching. But, as you probably know, it has been used successfully to teach (a) learners who have almost any disability including those with learning disabilities, speech/language disorders, mental retardation, behavior disorders, sensory impairments, and physical impairments; (b) learners who have mild, moderate, and severe expressions of these disabilities; (c) learners from a broad age range from preschoolers to adults; and (d) learners who need to acquire a broad range of skills. Thus, teachers of students with disabilities should know how to use direct instruction.

Direct instruction, as with all other instructional methods, should be evaluated on many different dimensions. For example, we need to be sure that our instructional methods are appropriate for the students and skills being taught, that the family members of the students are pleased and satisfied with the teaching strategies, that the children are participating appropriately in the activities, that the instruction is as normalized as possible, that children are treated with dignity and respect, and many other issues. However, two other issues are particularly important; these are: effectiveness and efficiency. These are discussed below.

Effectiveness refers to whether children are actually learning the skills being taught. If instruction, regardless of the methods being used, is not effective, then it should be adjusted. There are few defensible reasons for using instructional procedures, including direct instruction, when it is not producing desired and positive changes in the skills of students. Of course, effectiveness should be evaluated in terms of whether children learn the skills you are teaching, and whether they are using those skills when and wherever it is appropriate to use them.

Efficiency, however, is somewhat different. Efficiency refers to the relative value of one instructional methodology over another. Efficiency involves at least two components: First, before an instructional method or practice can be called "efficient," it must be effective - it must result in children learning the behaviors being taught. Second, before an instructional method or practice can be called "efficient," it must result in learning that is superior to some other instructional method.

At least two ways exist for evaluating whether one procedure is more or less efficient than another. We can say a strategy is efficient when it results in more rapid learning than some other strategy. For example, if you are trying to teach a group of students some important skills, and one strategy would allow you to accomplish this with 30 minutes of instruction and another would require 60 minutes, then the more efficient strategy would be the one that required only 30 minutes. This dimension of efficiency is often measured in terms of the number of sessions, number of trials, and number of minutes of instruction to criterion. The practice or method that results in more fewer sessions, trials, and minutes of instruction is the one that is more efficient and is recommended for later use.

The second way to measure and judge whether one strategy or practice is more efficient than another deals with how many behaviors are learned. Two strategies or practices may result in children learning a given set of skills in about the same amount of time (i.e., produce equally rapid learning), but one strategy may allow children to learn other skills as well. For example, teaching elementary-age children with moderate mental retardation to each read a list of six food words for shopping in the grocery store could be done individually or in a small group. It may require 40 minutes of instruction to teach a given child to read her list of six words in one-on-one (individual) instruction, and it may require 40 minutes of instruction to teach her those six words in a small group. However, if the other children in the group are being taught other food words, she might observe this and learn some of their words. Thus, in the individual sessions, she could only learn the six words, but in the small group sessions, she might learn 8 or 10 or more words. If this occurred, then the small group instructional session would be considered more efficient, because she learned more behaviors in about the same amount of time. Some of these behaviors were taught directly (target behaviors) to her and others were not taught directly (non-target).

The remainder of this manual is devoted to explaining how attending cues and responses can be used in direct instruction trials to increase the efficiency of learning. The procedures focus on both aspects of efficiency - increasing how rapidly children learn and increasing the number of behaviors they can learn. However, before you read any further, we present several questions you can ask yourself to ensure you mastered the content that has already been described.

Self-Test # 1: Questions

1. Highly accomplished and skilled teachers focus on students' attention in at least three areas (or for three reasons). What are these?

2. What are some questions that teachers face when planning their teaching activities?

3. In what type of instruction should attending cues and responses be used to increase its efficiency?

4. What are the four defining components of direct instructional activities?

5. List and define the two major types of behaviors that can be taught through direct instruction.

6. What is a "trial sequence" and what are some common steps of those sequences?

7. When presenting direct instruction in small groups, what are the two ways students respond?

8. Define effectiveness and efficiency.

9. List two ways that the "efficiency" of an instructional practice can be measured.

Answers to these questions are provided on the next page.

Answers to Self-Test # 1 Questions

1. Highly skilled teachers, focus on their students' attention for three reasons:
   (1) to decrease the occurrence of problem behaviors,
   (2) to increase the chances that students will learn, and
   (3) to ensure that students are attending to the critical or important aspects of the instructional activities and materials.

2. Teachers face many questions when planning their instructional activities, several of these were listed on pages 3 and 4; others, of course, exist.

3. Attending cues and responses should be used to increase the efficiency of direct instructional activities.

4. The four defining components of direct instruction are:
   (1) Teachers have identified some important behaviors that their students should be taught;
   (2) Direct instructional sessions are usually relatively short.
   (3) Direct instructional activities involve use of a defined trial sequence.
   (4) Direct instructional activities involve active student responding.

5. The two types of responses taught through direct instruction are (1) discrete behaviors - students' responses that are relatively brief and usually involve one behavior; and (2) chained behaviors - students' responses that require a number of behaviors to be performed in a sequence to complete a skill or task.

6. A trial sequence is a list of steps the teacher does when presenting information to students in direct instruction. Common steps are (a) securing students' attention, (b) presenting a stimulus or question, (c) providing students with an opportunity to respond, (d) providing help as needed to ensure correct responding, (e) providing feedback for students' responses.

7. When presenting direct instruction, students can (1) respond individually or (2) chorally (i.e., in unison).

8. Effectiveness means that children learn the behaviors that are taught. Efficiency means that one instructional strategy, method, practice results in superior learning to some other strategy, method, or practice.

9. The efficiency of instructional practices, methods, or strategies can be measured (a) by comparing how rapidly children learn the skills being taught (e.g., how many sessions, trials, or minutes of instruction are required to reach criterion), and/or (b) by comparing how many behaviors (target and non-target) are learned within a given amount of time.

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Definition and Description of Attending Cues and Responses

At this point you may be asking, "What are attending cues and attending responses?" Actually, they are things that teachers and students do quite often during direct instruction, and they occur early in the trial sequence.

Definitions

ATTENDING CUES are the behaviors teachers do to get children to look at, listen to, or otherwise orient toward or focus on the teachers' question or the stimulus the teacher is presenting. For example, when you are teaching a single child or a group of students, you have probably said, "Look.", "Listen.", "Get ready.", "Let's start.", or similar statements. Also, you may have asked, "Are you ready?", "Are you looking?", "Who can tell me?" Each of these are attending cues. What we try to communicate to students is: "Pay attention; this is important; get ready to learn/respond."

ATTENDING RESPONSES are the behaviors children do in response to attending cues. For example, they may stop what they are doing and listen attentively, they may look at you, or they may look at what you are holding. Each of these are examples of attending responses. Attending responses give you some indication that the students are ready to receive instruction, and ready for you to proceed with the presentation of the information you are trying to teach.

Selecting Attending Cues and Responses

Attending cues are important in direct instruction because they can be used to capture and/or focus students' attention. Attending responses are important in direct instruction because they given the teacher an indication that the child is ready to perform. As noted, teachers use attending cues, and students perform attending responses. Whether and which attending cues teachers use will vary depending upon what is being taught, the students' abilities and experiences, and how easily distracted the students are. Whether teachers require an attending response is dependent upon how attentive the children usually area, whether children are having difficulty learning a given behavior, and many other factors. It is important to note that attending cues and responses should only be used to enhance the effectiveness and efficiency of direct instruction. They should not be used when they seem to interfere or break the flow of responding.

In direct instruction, you initially need to make two major decisions. The first decision is whether to use an attending cue. Given that an attending cue will be used, then your second decision is to decided when you are going to use it. In our own teaching and in watching other teachers, attending cues appear to be used at three times: (a) only at the beginning of each direct instructional session, (b) at the beginning of each session and during the sessions whenever students seem inattentive, and (c) on every trial. This decision is made based on what is required to ensure that students attend to the instructional tasks and stimuli. The procedures described later are designed for using attending cues on every trial.

Given that you are going to use the attending cue on each trial, then three other decisions must be faced. These are: (a) will I use the same attending cue on each trial, (b) what type of attending cue will I use, and (c) what type of attending response will I require of my students? To help describe the possible answers to these questions, the table on the next page was constructed. Attending cues and responses are classified in this table. This classification system has two major parts: presentation variables and response variables. The presentation variables deal with the first two questions ("Will I use the same attending cue on every trial?" and "What type of attending cue will I use?"). These choices are presented on the left-hand side of the table. The response variables deal with the third question ("What type of attending response will I require of my students?"). The choices of attending responses are presented across the top of the table. Note that the table contains examples of the possible combinations; the examples are developed for sight word reading as the target behavior. For other behaviors, some changes would be required in the behaviors used by teachers.

Let's take each question separately starting with those that focus on the teacher's presentation of attending cues. The first question is, "Will I use the same attending cue on each trial?" The table contains two answers to this question: "yes - same for each trial," and "no - different across trials." If you use the same attending cue on each trial, it is easier; however, with repeated use, it may loose its ability to capture and focus students' attention. With other children, the same attending cue on each trial will be perfectly fine. It will be sufficient to orient them to the target stimulus. If you choose to use a different attending cue across trials, then you need to prepare a list of the attending cues you will use.

Taxonomy of Attending Cues and Attending Responses

Presentation Variables	Response Variables			
Type Across Trials / Nature of Cue	Individual		Group	
	Active	Inactive	Active	Inactive
Same for Each Trial				
General	On each trial the teacher says, "Look" & only the target student must look at the stimulus	On each trial the teacher says, "Time to work" & no response is required of any student	On each trial the teacher says, "Look" & all of the students must look at the stimulus	On each trial the teacher says, "Time to work" & no response is required of any student
Specific	On each trial the teacher says, "Name the letters" & only the target student names the letters	On each trial the teacher says, "Look" to the target student & the teacher names the letters	On each trial the teacher says, "Name the letters" & all group members name the letters	On each trial the teacher says, "Look" to the group and the teacher names the letters for the group
Different Across Trails				
General	Across different trials, the teacher says, "Look," "Touch," "Hold," or "Listen" (1 per trial); & only the target student must comply with the cue	Across different trials the teacher says, "Time to work," "Let's start," "I'm ready" (1 per trial); and no response is required of any student	Across different trials the teacher says "Look," "Touch," "Hold" or "Listen" (1 per trial); & all students must comply with the cue	Across different trials the teacher says, "Time to work," "Let's start," "I'm ready" (1 per trial); & all students must comply with the cue
Specific	Across different trials, the teacher says, "Name the letters," "Match," or "Trace these" (1 per trial); & only the target student must comply with the cue	Across different trials the teacher says, "Look" or "Listen" to the target student & the teacher names, matches, or traces the stimuli (1 per trial; no response required of student	Across different trials the teacher says "Name the letters," "Match," or "Trace these" (1 per trial) & all students must comply with the cue	Across different trials the teacher says, "Look" or "Listen" to group & teacher names, matches, or traces stimuli (1 per trial) for all students; no response is required of any student

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The second question asks, "What type of attending cue will I use?" Two choices are provided: general and specific. General attending cues orient students' attention to the task you are presenting or the question you are asking; specific attending cues orient students' attention to the critical features of the task or stimulus. For example, if you are teaching sight word reading, then saying, "Look" as you hold up a sight word is a general attending cue. It tells the students to look at what you are holding, but it does not call attention to the specific aspects of the word that is on the card you are holding. The specific attending cue, however, may involve you saying, "Say the letters of this word." In this case, your attending cue is calling attention not just to the card you are holding up, but to what is on the card. Often, general attending cues are easier to design and use, and if students readily learn when they are being used, we recommend that you employ them. However, when children are having difficulty learning or when progress is slow, we recommend use of specific attending cues.

After you have determine whether you will present the same attending cue on each trial or a different one and after deciding whether to use a general or specific attending cue, you need to determine how you will have the students respond to the attending cue, and this involves asking two questions: "Will I have students respond individually or as a group to the attending cue?" and "Will I have them respond actively or inactively?" As noted earlier, when presenting direct instruction to a group of students, they can respond to the target behavior individually or chorally; and with individual responding, trials can be presented in round-robin or random order. With attending cues, regardless of the type of responding you are having students do to the target question, you can use either individual or group responding. For example, if you are having students respond individually to the task direction or question, you can have them respond as a group or individually to the attending cue. Usually, it seems desirable to have group responding, particularly when using general attending cues. For example, having all children look at a stimulus even if it is a given child's turn may increase the likelihood that all children will learn that child's behavior. A trial sequence with a group attending cue and individual responding may go like this: The teachers holds up the stimulus card, says, "Everybody Look," checks to see that each child is looking, and then says, "John, what word is this?" John would be given a chance to answer or would be prompted to answer, and then he would be given feedback (e.g., praise for a correct response, and a correction for an error response). Although all the students had to respond to the attending cue, only John had to respond to the target stimulus or task direction.

Once you have decided whether to have children respond individually or as a group to the attending cue, you still have one more question to answer, "Will I require an active or inactive attending response?" Active attending responses require the child to "show" you in some what that they are attending. This may involve looking at the stimulus, looking at you, and many others. An inactive attending response does not require the child to change what they are doing after you present the attending cue. Generally, we recommend using active attending cues, but a lot of this depends upon how readily children attend, whether they are making rapid progress in learning the target behaviors, and what they are used to doing.

The general guideline for using attending cue and attending responses in direct instruction is as follows:

> **"Use the quickest and easiest attending cue and response necessary to ensure that students orient toward the target stimulus."**

What is important is whether students are learning the target behaviors; attending cues and attending responses are simply tools that the teacher has to help ensure that students are responding appropriately.

For review, several points should be made. As noted, attending cues and responses can be used only at the beginning of the direct instruction session, when children seem inattentive, or on every trial. If you decide to use attending cues and responses on every trial, you need to make several decisions. First, you need to decide whether you will use the same attending cue on all trials or whether you will use different ones across trials. Second, you need to decide whether you will use a general attending cue or a specific attending cue. Third, you need to decide whether individual children will respond to the attending cue or whether the whole group must respond. Fourth, you need to decide whether you will require an active or inactive attending response. Before you read how to use attending cues and attending responses to increase the efficiency of instruction, you may want to take "Self-Test # 2."

Self-Test # 2: Questions

1. What are attending cues?
2. What are attending responses?
3. When are the three times teachers often use attending cues and attending responses?
4. List the questions you must ask yourself when planning to use attending cues and responses on every trial?
5. What is the primary difference between general and specific attending cues?
6. What is the primary difference between active and inactive attending responses?
7. Give an example of a general attending cue delivered the same on every trial with a group inactive attending response.
8. Give an example of specific attending cues delivered differently across trials requiring an individual and active attending response.
9. What is the general guideline for deciding which attending cues and attending responses to use?

The answers are provided on the next page.

Answers to Self-Test # 2 Questions

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1. Attending cues are the behaviors teachers do to get children to look at, listen to, or otherwise orient toward or focus on the teachers' question or the stimulus the teacher is presenting.

2. Attending responses are the behaviors children do in response to attending cues - these responses are designed to "show" the teacher that children are attending.

3. Teachers often use attending cues and responses at three times:
   (1) Only at the beginning of sessions,
   (2) Only when children appear inattentive, and
   (3) On every trial of the direct instruction session.

4. The questions teachers must ask in deciding whether to use the attending cues and attending responses are:
   (1) When am I going to use attending cues/responses?
   (2) If I am going to use them on every trial, will the attending cues be the same on every trial or different across trials?
   (3) If I am going to use them on every trial, will the attending cues be general or specific?
   (4) If I am using attending cues on every trial, will I have individual students or the group respond to the attending cue?
   (5) If I am using attending cues on every trial, will I require students to use active or inactive attending responses?

5. The primary difference of a general rather than specific attending cue is that the general attending cue calls the students' attention to the stimulus, and the specific attending cue calls the students' attention to the important aspects of the stimulus.

6. The primary difference of an active versus inactive attending responses is that students are required to engage in some behavior that shows they are attending with an active response, but are not required to do such a behavior with an inactive attending response.

7. On each trial the teacher says, "Time to work." and no response is required of any student.

8. When teaching sight words, it might be: Across different trials, the teacher says, "Name the letters," "Match these," "Trace these letters" (each cue being delivered on different trials, but only one per trial), and only the target students (i.e., the one who is supposed to answer) must comply with the attending cue by naming the letters, matching them, or tracing the letters.

9. The general guideline for using attending cues and responses is: Use the quickest and easiest attending cue and response necessary to ensure that students orient toward the target stimulus.

Increasing Efficiency by Using Attending Cues and Responses

As noted earlier in this manual, direct instruction should be evaluated on several aspects, and one of these is its efficiency. Efficiency requires that the instruction be effective and that it be superior to some other strategy. To measure the efficiency of instruction, we can determine how rapidly children are learning and we can measure whether the instruction is resulting in children learning the behaviors that are taught directly and behaviors that are not taught directly. Attending cues and responses have been used to promote each type of efficiency. In the following sections we deal with each type.

Using Attending Cues/Responses to Increase the Rapidity of Learning

To ensure rapid learning in direct instruction, you must consider several things. These include (a) teaching skills that are on an appropriate level for the children (i.e., those for which they have mastered the prerequisite skills); (b) ensuring that children are attending to the stimulus; (c) providing children with sufficient opportunities to respond; (d) providing students with prompts or help so that they can respond correctly; (e) fading and removing the prompts or help you give students systematically so that they respond independently and correctly; and (f) using effective feedback in the form of reinforcers (Wolery, Ault, & Doyle, 1992; Wolery, Bailey, & Sugai, 1988). However, over the years, we have occasionally encountered students who were being taught the appropriate skills, but they were not making rapid progress. Their teachers were using instructional strategies that had been effective with a lot of similar students and with the skills being taught. Their teachers also were using those strategies correctly and were using reinforcers that were effective in other instructional programs. Yet, progress was very slow or almost non-existent.

In trying to solve this problem and present the instruction so that the children would learn rapidly, we have often manipulated the attending cues and responses. Frequently, when children were not making progress, their teachers were using general attending cues (e.g., having students look at them or at the stimulus). The students were looking, but from trial to trial it appeared that they were not paying attention to the important aspects of the trial. As a result, we have often begun to use specific rather than general attending cues. For example, during the initial instruction, the teacher would say the child's name and then say, "Look." The child would look at the stimulus or at the teacher, then the teacher would say, "What is this (word, number, or whatever was being taught)?" The child would often respond incorrectly. This is an example of using a general attending cue with an active attending response. We often changed the trial sequence to include a specific attending response.

The new trial sequence would occur as follows: The teacher would hold up the stimulus, put two cards on the table one identical to the stimulus and one different from it. The teacher would then say the child's name and give them the stimulus and say, "Put it on the same." The child then would have to look at the stimulus and match it to one of the two that were on the table. When the student made a correct match, the teacher would say, "What is this (word, number, or whatever was being taught)?" The use of this specific matching attending cue and response often resulted in children learning.

The conclusion we made from having several of these experiences was that sometimes children were not attending to the critical aspects of the stimuli being taught. When they were required (i.e., through the active attending response to a specific attending cue) to attend to the important aspects of the stimulus, they often began to learn rapidly. This has worked with other specific attending cues such as saying the letters of a sight word they were being required to read, imitating the teacher saying the letters in sequence, tracing with their finger the letters, writing the letters down, and so on. Other specific attending cues/responses, have been to require students to repeat the task direction. For example, if you are teaching students basic math facts (e.g., two plus two equals? and eight minus five equals?) having the child re-state the problem before answering can be used as a specific attending cue and active attending response. The point is that specific attending cues and active attending responses appear to focus students attention on the parts of the stimulus that were important.

Remember that we stated a general guideline about using attending cues and responses. That guideline was: "Use the quickest and easiest attending cue and response necessary to ensure that students orient toward the target stimulus." With students who are <u>not</u> making progress, but are being taught appropriate skills with otherwise effective strategies and with powerful reinforcers, we recommend a second guideline:

> **"Use specific attending cues and active attending responses that demonstrate clearly that the student is attending to the critical aspects of the stimulus."**

Thus, with most students and most direct instruction programs, we use general attending cues because they are quick and easy to implement. And, with most students, they are sufficient to ensure that students are attending. However, when students are not making progress, we then often move to an attending cue and attending response that makes them show us they are attending to the important aspects of the stimulus. When we do this, students often begin to learn more rapidly and we have increased the efficiency of our instruction!

Using Attending Cues/Responses to Teach Target and Non-Target Behaviors

Another way to increase the efficiency of instruction is by helping children to learn their target behaviors and other behaviors that are not taught directly. There are actually two ways to do this. The first is to use instructive feedback which involves adding extra, non-target stimuli or information to the feedback after students respond. For more information on this procedure see the companion manual for this one; it is titled: Instructive feedback: Increasing opportunities for learning through the addition of incidental information (Werts, Wolery, & Holcombe, 1991).

The second way to do this is to put the additional, non-target information in the attending cues and/or the attending responses. For example, when teaching children to read sight words, teachers have used various forms of spelling as attending cues and attending responses. For example, at the beginning of the trial, the teacher says, "Say these letters." (specific attending cue), and has the child say the letters of the word in order (active attending response). This has resulted in children not only learning to read the sight words, but also learning to spell some of the words. The sight words are the target behaviors, and the spelling is the related, non-target behaviors. Another variation in the same task is to have children repeat the letters as the teacher says them, and still another variation is to have the children write the letters. Although much of the research that has focused on adding non-target behaviors to the attending cues and responses have focused on sight word reading and spelling, this is by no means the extent of the potential applications. Other possible examples include embedding synonyms or antonyms in the antecedent event when teaching sight words, naming the color of shapes when teaching expressive identification of shapes, providing labels of objects when teaching children to identify colors, and providing short statements about objects or pictures when teaching children to label those objects or pictures.

In some cases, you might provide a specific attending cue, but not require an attending response beyond looking and listening. For example, if you were teaching children to label photographs of various occupations, you could use a specific attending cue such as stating factual information about the occupation. If one of the photographs was of a mechanic, the extra information inserted into your specific attending cue might be "This person fixes cars." The children would not be required to perform an active attending cue beyond looking at the card. However, it is possible that they would learn to not only name the occupations taught directly to them, but also to learn the factual (non-target information) that you presented in your specific attending cue.

When adding this extra, non-target information into the attending cues and/or attending responses, you will needed to make several decisions. These are:

- o What extra information will be presented,
- o how many different pieces of information will be presented,
- o on which trials will the information be presented,
- o in what mode will the information be presented,
- o what child response is expected, and
- o how the information will be assessed.

Each of these issues are discussed in the following paragraphs.

What incidental information will be presented?

Once the target behavior has been identified and other relevant decision have been made (e.g., which instructional strategies to use, whether to teach in a small group, when to teach, etc.), you must decide what non-target information will be included in the trial sequence. In the existing research, discrete behaviors or small chains of behaviors have been provided as the non-target information. These types of behaviors appear to be well suited to the this method, because they take minimal time to include in the trial sequence. As a result the length of the session is not increased substantially. Another issue to consider when selecting non-target information is how related it is to the target behavior. Specifically, whether it comes from the same curricular domain and whether it is conceptually related to the target behavior. For example, when the target behavior is reading sight words, you may ask the student to name the letters in the word prior to asking him to name the word. In this example, the non-target information would be spelling and the behavior being taught directly would be the sight word, but they are highly related to one another.

How Many Pieces of Information Will Be Provided?

In most cases only one extra non-target, piece of information would be added for each behavior that is taught directly. However, there are exceptions. For instance, in the earlier example where the teacher was teaching the students to name the occupations depicted in pictures and was presenting factual statements as the non-target information. The teacher would need to present at least two extra, non-target statements for each picture. If he did not, the students may learn to say, "Mechanic" each time the teacher said, "This person fixes cars" but they may not learn to label the picture. That is, they could only be responding to the factual information presented. Therefore, on some trials the teacher might say, "This person fixes cars," but on other trials say, "This person works in a garage." Of course, other statements could also be added (e.g., "This person uses wrenches" or "This person repairs trucks."). To date, little research has addressed this issue.

As another example, if you were teaching the sight word "large", you might model the correct spelling on every trial, or you may model the spelling of the word on half of the trial presentations and state the antonym (i.e., "Small") on the remaining trial presentations. The first trial may go like this: "The letters in this word are l-a-r-g-e. What is this word?", the second trial may be: "The opposite of this word is "small". What is this word?". In this example the task direction is "What is this word?" The extra information is the spelling of the word large and the antonym "small".

When making the decisions of how many pieces of extra information to present, you should consider (a) the learning abilities of individual children, and (b) the number of target behaviors to be instructed. Older children or children who learn rapidly may be able to learn more pieces of extra information. However, children who have difficulty learning target information or who are slow learners may benefit from the addition of only one piece of extra information.

Which trials will receive the extra information?

This decision must be made with consideration of the previous decision regarding how many pieces of extra information are presented. If several different pieces of non-target information are being taught in one instructional session, you may decide to present it on each trial so the children will have more exposure to the non-target information. However, if you have planned for a long instructional session, you may choose to present the extra information on only half of the instructional trials. Research to date has not evaluated all of these possibilities. The current research has presented extra information on every trial.

What mode of presentation will be used?

As you are selecting the extra information, decisions must also be made on the mode of presentation. You may provide a visual model, a verbal model, or a combination of the two. In the existing literature, Alig-Cybriwsky, Wolery, and Gast (1990); Gast Doyle, Wolery, Ault, and Baklarz (1991); and Wolery, Ault, Gast, Doyle, and Mills (1990) provided a verbal and a visual model. They were teaching sight word reading, and showed a card with the word on it and then said the letters in the word. However, Gast, Ault, Wolery, Doyle, and Belanger (1988) only provided a verbal statement. They were teaching students to read words for various foods, and they told the students the type of food each word represented. Keel and Gast (1992), Winterling (1990), and Yancey (1987) provided only a visual model. For example, in teaching sight word reading, Winterling had the students write the letters from a visual model before being asked to read them. In practice, the mode of the presentation will depend a great deal on what the target behaviors are and what the extra, non-target information is.

What student response will be required?

After determining the extra information and the presentation mode, child responses must be determined. Specifically, you must determine whether the child will be required to make an active response to the extra information or an inactive response. Of the eight studies with extra information in the antecedent event, Gast et al. (1988) and Gast et al. (1991) were the only studies which required an inactive student response. In these studies the teacher verbally presented the extra information and the student made no response related to that information. For example, in Gast et al. (1991) the teacher instructed the child to look at a flash card of a word and then named the letters in the word. The child was not required to make any response. In the remaining five studies children were required to make an active response such as saying or writing the letters in the target word. In the Winterling (1990) study, the teacher told the child to look at a flash card of a word and then told the child to write the word. An active response, writing the word, was the extra information. After the child wrote the word, the teacher gave a task direction asking the child to name the word.

The decision to have the child make an active response may be based on the additional length of time that an active response may add to the instructional session. You may be able to present the information more rapidly than the child. If time is not a factor, then you may want to choose an active response. Active responses insure that the child has attended to the relevant characteristics of the stimuli and generally increases the effectiveness of instruction.

In addition to determining the response of the child, when teaching more than one student you must decide whether only the student receiving the trial will respond or whether the entire group will respond to the extra information presented in each trial. The options were reviewed in earlier in the manual.

How will learning be monitored?

After each of the decisions listed above have been made, you must decide how acquisition of the non-target information will be assessed. In all of the research on adding non-target information into the attending cues and responses, the extra information was assessed before the instruction began and after children met criterion on the behaviors being taught directly. Another alternative is to assess children's acquisition of the information on a daily or weekly basis. We do not know what effects more frequent assessments of the non-target information may have on the acquisition rates of that information; however, logic would suggest that it would be acquired more quickly.

Summary of Steps for Adding Non-Target Information to Attending Cues and Responses

To increase the likelihood that students will learn extra, non-target behaviors that are inserted into the attending cues and/or attending responses, you must make several decisions. These are:

- What extra information will be presented,
- how many different pieces of information will be presented,
- on which trials will the information be presented,
- in what mode will the information be presented,
- what child response is expected, and
- how the information will be assessed.

Many of these decisions must be made on the basis of teachers' judgements, although some of the research provides suggestions on how to do it. Self-Test # 3 is presented on the next page.

Self-Test # 3: Questions

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1. What are the two major ways that manipulating the attending cues and attending responses can increase the efficiency of learning?

2. What general guideline about the use of attending cues and responses should be followed when children are not making adequate progress on target behaviors?

3. What are some steps of teachers must address when planning to add non-target information to attending cues and responses?

Answers are provided on the next page

Answers to Self-Test # 3

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1. Manipulating the attending cues and attending responses can increase the efficiency by
   (a) helping children focus more directly on the critical aspects of the target stimulus, and
   (b) adding extra, non-target information to the attending cues and/or the attending responses.

2. When children are not making adequate progress on target behaviors, teachers should "use specific attending cues and active attending responses that demonstrate clearly that the student is attending to the critical aspects of the stimulus."

3. The steps teachers must address when planning to add non-target information to attending cues and responses are: (a) deciding what extra information will be presented, (b) deciding how many different pieces of information will be presented, (c) deciding on which trials the extra information will be presented, (d) deciding in what mode will the information be presented, (e) decided what the child's attending response will be, and (f) deciding how to monitor the students' learning.

Research Related to Extra Information in the Antecedent Event

In this section, the reader is provided with summaries of the research related to adding non-target information to the attending cues and responses of direct instructional trials to increase the efficiency of that instruction. A complete reference of each study is presented in Appendix A. Each of the eight research studies that added extra information to the antecedent event are described below. These descriptions identify the target behaviors, extra information, instructional strategy, and a description of how the extra information was presented.

Alig-Cybriwsky et al. (1990) assessed the use of a constant time delay procedure in teaching four preschoolers with developmental delays in a small group arrangement to read sight words. The spelling of the target word was provided as extra information. A group attending cue was used in which the teacher pointed to and named the letters in the target word. The children repeated the letters as the teacher read. In this study all four preschool-aged children acquired all target sight words. Extra information, spelling, was assessed receptively prior to instruction for a group mean of 8.1%; following instruction the group mean was 70%.

Gast, Doyle, Wolery, Ault, and Baklarz (1991) used a small group arrangement and a constant time delay procedure to teach four elementary children with mild mental retardation to read sight words. Spelling of the words was provided as extra information. Prior to each presentation of the target word, the teacher instructed the student receiving the trial to look and then she spelled the letters in the target word. No response was required from the students. Each child learned their twelve target words. The mean percent of correct spelling was 68.8% with a range of 50% to 100% across the four children.

Gast et al. (1988) taught four elementary-aged students with moderate mental retardation in a 1:1 instructional arrangement to name sight words of foods. In this study a constant time delay procedure was compared to the system of least prompts. No extra information was provided during constant time delay instruction. The prompt levels in the system of least prompts instruction included a verbal description of the classification categories of the target food words. For example, if the sight word was broccoli, one of the verbal prompts was "It is a vegetable." Children acquired all behaviors instructed with both the constant time delay procedure and the system of least

prompts; however, the constant time delay procedure resulted in more efficient learning (i.e. number of sessions, percent of errors, and direct instruction time through criterion).

Keel and Gast (1992) studied the implementation of a constant time delay procedure with three elementary students with learning disabilities. Students were instructed in a small group arrangement to read basal vocabulary words with spelling provided as the extra information. Prior to all instructional trials, all students were required to copy a written model of the target word. If a student copied a word incorrectly, he was required to write the word again while the teacher read the letters. Children in this study acquired all target words. Percent of acquisition of extra information, spelling, was low. Three sets of words were instructed. Although children were able to spell some of the words in each set after each instruction; however, the ability to spell these words did not maintain. After instruction was completed on all word sets, one child correctly spelled 33% of the words and two children did not correctly spell any of the words.

Shelton, Gast, Wolery, and Winterling (1991) investigated the use of a progressive time delay procedure in teaching two small groups of four children each to read sight words presented on a flash card. Children participating in this study ranged in age from 9 to 12 years and had mild mental retardation. Naming the letters of the target word in order was presented as the extra information. When it was a given student's turn to receive a trial, he was presented with the attention cue, "Spell the word." If the student spelled the word correctly, the teacher repeated the spelling. When the word was spelled incorrectly, the teacher pointed to the letter and modelled the appropriate letter name and then pointed in sequence to each letter in the word and modelled while the student repeated. Children in this study acquired all target behaviors. Extra information in the antecedent event, spelling, was not acquired be one child. Of the remaining seven children, rates of acquisition of correct spelling ranged from 17% to 100% with a mean of 46%.

Winterling (1990) used a constant time delay procedure to teach sight word reading to three elementary students with learning disabilities. Two students were required to copy a written model of the target word prior to reading that word and one student was required to orally name the letter in the word, thus embedding written spelling as the extra information in the antecedent event. The three children in this study learned to read all target sight words. One child learned to orally spell all of his target words, one child learned to write 66% of her target words, and the remaining child did not learn to write any of his target words.

Wolery, Ault, Gast, Doyle, and Mills (1990) taught four elementary student with learning disabilities to read sight words using a constant time delay procedure. The authors investigated the use of two different ways of presenting the extra information. Half of each student's sight words were taught using a group attentional response. A group attentional response required all students to name the letters of the target word in correct order following the teacher's verbal model. After all students named the letters in the target word, the target student read the word. The remaining sight words were taught using a individual attentional response. Only the student who was receiving a trial on the sight word was required to imitate the teacher's verbal model of the correct spelling of the target word. Children acquired all target behaviors; however, those instructed with an individual attentional response were acquired more efficiently (i.e. number of sessions and number/percent of errors through criterion) than those instructed with a group attentional response. In this study the mean percentage of net gain of spelling was 26 with a range of 7 to 49.

Yancey (1987) used a constant time delay procedure in a 1:1 instructional format to teach sight word reading to five elementary students with mild handicaps. Students were required to say the letters in the target word prior to reading the word. If a child incorrectly read a word, he was instructed to read the letters again. As in the previous studies, children acquired all target words. One child learned to spell 10%, one child learned to spell 60%, and the remaining three children learned to spell 95% to 100% of the extra information.

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Appendix A

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